

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A dielectric layerbarrier structure, comprising:
a densified amorphous dielectric layer deposited on a substrate by pulsed-DC, substrate biased physical vapor deposition,
a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal, and
wherein the densified amorphous dielectric layer is a barrier layer.
2. (Cancel).
3. (Currently amended) The layerstructure of claim 1, wherein the barrier layer is also an optical layer.
4. (Currently amended) The layerstructure of claim 31, wherein the barrier layer includes a TiO₂ layer.
5. (Currently amended) The layerstructure of claim 31, wherein the barrier layer includes an Alumina/Silica layer.
6. (Withdrawn) The layerstructure of claim 3, further including a soft-metal breath treatment.
7. (Withdrawn) The layerstructure of claim 6, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
8. (Withdrawn) The layerstructure of claim 1, wherein the barrier layer is also an electrical layer.

9. (Withdrawn) The layerstructure of claim 8, wherein the barrier layer includes a capacitive layer.

10. (Withdrawn) The layerstructure of claim 9, wherein the capacitive layer is a TiO₂ layer.

11. (Withdrawn) The layerstructure of claim 9, wherein the capacitive layer is an Alumina/silica layer.

12. (Withdrawn) The layerstructure of claim 8, wherein the barrier layer includes a resistive layer.

13. (Withdrawn) The layerstructure of claim 12, wherein the resistive layer is indium-tin metal or oxide.

14. (Withdrawn) The layerstructure of claim 8, further including a soft-metal breath treatment.

15. (Withdrawn) The layerstructure of claim 14, wherein the soft-metal breath treatment is an indium-tin vapor treatment.

16. (Withdrawn) The layerstructure of claim 1, wherein the barrier layer includes a tribological layer.

17. (Withdrawn) The layerstructure of claim 16, wherein the tribological layer is a TiO₂ layer.

18. (Withdrawn) The layerstructure of claim 16, wherein the tribological layer is Alumina/silica.

19. (Withdrawn) The layerstructure of claim 16, further including a soft-metal breath treatment.

20. (Withdrawn) The layerstructure of claim 19, wherein the soft-metal breath treatment is an indium-tin vapor treatment.

21. (Withdrawn) The layerstructure of claim 1, wherein the barrier layer is a biologically immune compatible layer.

22. (Withdrawn) The layerstructure of claim 1, wherein the biologically immune compatible layer is TiO_2 .

23. (Withdrawn) The layerstructure of claim 21, further including a soft-metal breath treatment.

24. (Withdrawn) The layerstructure of claim 23 wherein the soft-metal breath treatment is an indium-tin vapor treatment.

25. (Currently amended) The layerstructure of claim 1, wherein the dielectric film is TiO_2 .

26. (Currently amended) The layerstructure of claim 1, wherein a target utilized to form the dielectric film has a concentration of 92% Al and 8% Si.

27. (Currently amended) The layerstructure of claim 1, wherein ~~the~~ a target utilized to form the dielectric film is formed from metallic magnesium.

28. (Currently amended) The layerstructure of claim 1, wherein ~~the~~ a target material utilized to form the dielectric film comprises materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.

29. (Currently amended) The layerstructure of claim 28, wherein the target material includes a concentration of rare earth metal.

30. (Currently amended) The layerstructure of claim 1, wherein ~~the~~a target material utilized to form the dielectric film comprises a sub-oxide of a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.

31. (Withdrawn) The layerstructure of claim 1, further including a soft-metal breath treatment.

32. (Withdrawn) The layerstructure of claim 31, wherein the soft-metal breath treatment is an indium-tin vapor treatment.

33. (Withdrawn) The layerstructure of claim 1, wherein the dielectric film has a permeable defect concentration of less than about 1 per square centimeter.

34. (Currently amended) The layerstructure of claim 1, wherein ~~the~~a water vapor transmission rate through the barrier layer is less than about 1×10^{-2} gm/m²/day.

35. (Currently amended) The layerstructure of claim 1, wherein ~~the~~an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.

36. (Currently amended) The layerstructure of claim 1, wherein the barrier layer has a thickness less than about 500 nm.

37. (Currently amended) The layerstructure of claim 36, wherein the water vapor transmission rate is less than about 1×10^{-2} gm/m²/day.

38. (Currently amended) The layerstructure of claim 1, wherein a thickness of the barrier layer thickness is less than about 1 micron and ~~the~~a water vapor transmission rate through the barrier layer is less than about 1×10^{-2} gm/m²/day.

39. (Withdrawn) The layerstructure of claim 1, wherein the barrier layer operates as a gate oxide for a thin film transistor.

40. (Withdrawn) A method of forming a barrier layer, comprising:

providing a substrate;
depositing a highly densified, amorphous, dielectric material over the substrate in a pulsed-DC, biased, wide target physical vapor deposition process.

41. (Withdrawn) The method of claim 40, further including
performing a soft-metal breath treatment on the substrate.

42. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising 92% Al and 8% Si.

43. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising of Titanium.

44. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target material comprising materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.

45. (Withdrawn) The method of claim 41, wherein the soft-metal breath treatment is an indium/tin breath treatment.

46. (New) The dielectric layer of claim 1, wherein the soft-metal is indium-tin.

47. (New) The dielectric layer of claim 1, wherein the barrier layer is an electrical layer.

48. (New) A barrier structure, comprising:
a densified amorphous dielectric layer deposited on a substrate by pulsed-DC, substrate biased physical vapor deposition,
wherein the densified amorphous dielectric layer is a barrier layer, and
wherein a water vapor transmission rate through the barrier layer is less than about 1×10^{-2} gm/m²/day.

49. (New) The structure of claim 48, wherein the barrier layer is also an optical layer.
50. (New) The structure of claim 48, wherein the barrier layer includes a TiO₂ layer.
51. (New) The structure of claim 48, wherein the barrier layer includes an Alumina/Silica layer.
52. (New) The structure of claim 48, wherein an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.
53. (New) The structure of claim 48, wherein the barrier layer has a thickness less than about 500 nm.
54. (New) The structure of claim 48, further including a soft-metal at the interface between the barrier layer and the substrate.